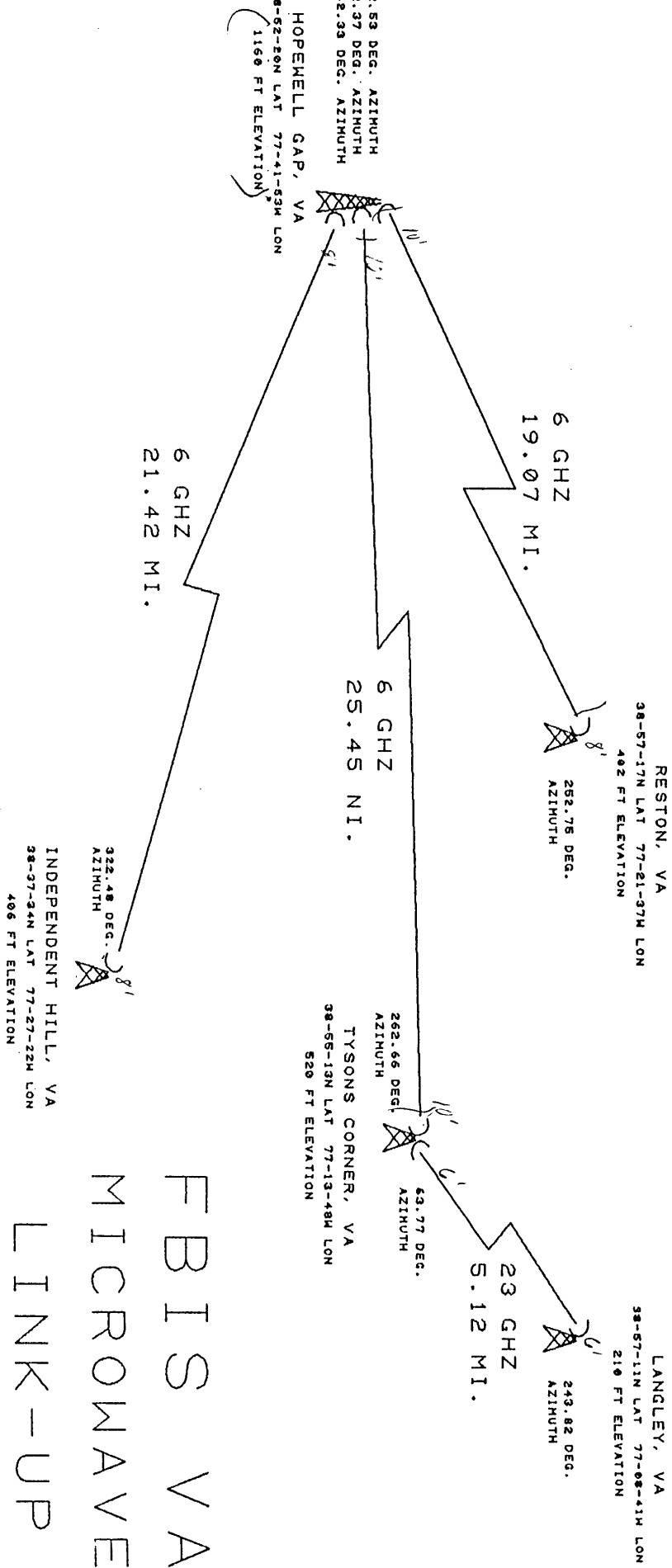
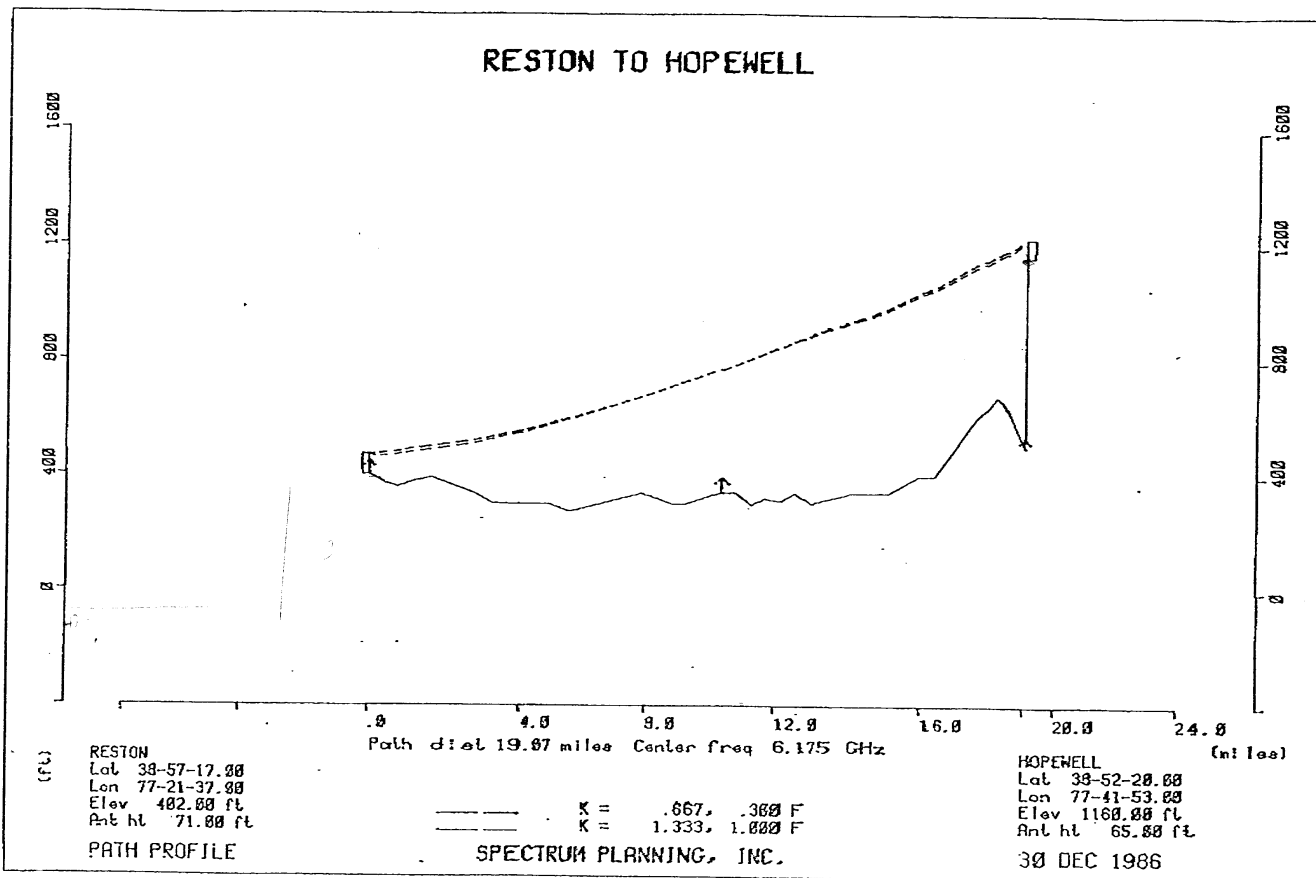






## SPECTRUM PLANNING, INC.

## ANTENNA HEIGHT ANALYSIS

30 DEC 1986

PAGE 1

|                 |               |               |                                 |
|-----------------|---------------|---------------|---------------------------------|
|                 | <u>SITE A</u> | <u>SITE B</u> | Dist 19.070 miles               |
| Site name       | RESTON        | HOPEWELL      | Freq 6.175 GHz                  |
| Latitude        | 38-57-17.00   | 38-52-20.00   | Clearance 1) 1.00 F @ K = 1.333 |
| Longitude       | 77-21-37.00   | 77-41-53.00   | 2) .30 F @ K = .667             |
| Elev (ft)       | 402.00        | 1160.00       |                                 |
| Existed ?       | no            | no            |                                 |
| Fixed ht (ft)   |               |               |                                 |
| Max ant ht (ft) | 80.00         | 100.00        |                                 |
| Min ant ht (ft) | 50.00         | 10.00         |                                 |
| Increment (ft)  | 2.00          | 5.00          |                                 |

| Profile input points |      |      | (Ground elevations(ASL) in ft, |      |      | Obstruction heights(ASL) in ft) |      |      |
|----------------------|------|------|--------------------------------|------|------|---------------------------------|------|------|
| Dist                 | Grd  | Obht | Dist                           | Grd  | Obht | Dist                            | Grd  | Obht |
| (mi)                 | (ft) | (ft) | (mi)                           | (ft) | (ft) | (mi)                            | (ft) | (ft) |
| .01                  | 400. | 50.0 | 7.86                           | 339. | 0.0  | 12.59                           | 339. | 0.0  |
| .84                  | 357. | 0.0  | 8.85                           | 300. | 0.0  | 13.05                           | 301. | 0.0  |
| 1.75                 | 392. | 0.0  | 9.23                           | 300. | 0.0  | 14.04                           | 340. | 0.0  |
| 3.20                 | 302. | 0.0  | 10.30                          | 340. | 50.0 | 14.42                           | 340. | 0.0  |
| 3.36                 | 302. | 0.0  | 10.68                          | 340. | 0.0  | 14.50                           | 340. | 0.0  |
| 3.66                 | 300. | 0.0  | 11.21                          | 297. | 0.0  | 14.57                           | 340. | 0.0  |
| 4.88                 | 300. | 0.0  | 11.67                          | 320. | 0.0  | 14.72                           | 341. | 0.0  |
| 5.57                 | 274. | 0.0  | 12.13                          | 311. | 0.0  | 14.95                           | 340. | 0.0  |

| Control pt no        | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Dist from A (mi)     | .01    | .84    | 1.75   | 3.20   | 3.36   | 3.66   | 4.88   | 5.57   |
| Dist from B (mi)     | 19.06  | 18.23  | 17.32  | 15.87  | 15.71  | 15.41  | 14.19  | 13.50  |
| Grd elev (ft)        | 400.00 | 357.48 | 392.18 | 301.86 | 302.22 | 300.00 | 300.00 | 274.48 |
| Above grd ht (ft)    | 50.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| Bulge @ K=1.333 (ft) | .10    | 7.65   | 15.19  | 25.42  | 26.37  | 28.21  | 34.64  | 37.60  |
| 1.0 Fresnel (ft)     | 2.90   | 25.99  | 36.62  | 47.37  | 48.25  | 49.91  | 55.30  | 57.61  |
| Bulge @ K=.667 (ft)  | .19    | 15.30  | 30.38  | 50.84  | 52.75  | 56.42  | 69.27  | 75.19  |
| .3 Fresnel (ft)      | .87    | 7.80   | 10.99  | 14.21  | 14.48  | 14.97  | 16.59  | 17.28  |

## SPECTRUM PLANNING, INC.

## ANTENNA HEIGHT ANALYSIS

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|                 |               |               |                                 |
|-----------------|---------------|---------------|---------------------------------|
|                 | <u>SITE A</u> | <u>SITE B</u> | Dist 21.420 miles               |
| Site name       | HOPEWELL      | INDEP         | Freq 6.175 GHz                  |
| Latitude        | 38-52-20.00   | 38-37-34.00   | Clearance 1) 1.00 F @ K = 1.333 |
| Longitude       | 77-41-53.00   | 77-27-22.00   | 2) .30 F @ K = .667             |
| Elev (ft)       | 1160.00       | 406.00        |                                 |
| Existed ?       | no            | no            |                                 |
| Fixed ht (ft)   |               |               |                                 |
| Max ant ht (ft) | 100.00        | 100.00        |                                 |
| Min ant ht (ft) | 10.00         | 10.00         |                                 |
| Increment (ft)  | 5.00          | 5.00          |                                 |

| Profile input points |       |      | (Ground elevations(AMSL) in ft, Obstruction heights(AGL) in ft) |      |      |       |      |      |       |      |      |
|----------------------|-------|------|-----------------------------------------------------------------|------|------|-------|------|------|-------|------|------|
| Dist                 | Grd   | Obht | Dist                                                            | Grd  | Obht | Dist  | Grd  | Obht | Dist  | Grd  | Obht |
| (mi)                 | (ft)  | (ft) | (mi)                                                            | (ft) | (ft) | (mi)  | (ft) | (ft) | (mi)  | (ft) | (ft) |
| .10                  | 1160. | 35.0 | 6.74                                                            | 332. | 0.0  | 12.27 | 297. | 50.0 | 19.18 | 252. | 0.0  |
| 2.85                 | 400.  | 0.0  | 7.26                                                            | 340. | 0.0  | 13.91 | 200. | 0.0  | 19.35 | 251. | 0.0  |
| 3.46                 | 400.  | 0.0  | 8.55                                                            | 299. | 0.0  | 15.90 | 200. | 0.0  | 20.13 | 340. | 0.0  |
| 4.23                 | 345.  | 0.0  | 8.73                                                            | 300. | 50.0 | 16.59 | 211. | 0.0  | 20.47 | 340. | 0.0  |
| 4.58                 | 347.  | 0.0  | 9.83                                                            | 240. | 0.0  | 17.19 | 200. | 0.0  | 20.99 | 300. | 0.0  |
| 5.01                 | 340.  | 0.0  | 10.63                                                           | 240. | 0.0  | 17.54 | 200. | 0.0  | 21.41 | 400. | 50.0 |
| 5.53                 | 340.  | 0.0  | 10.80                                                           | 242. | 0.0  | 18.06 | 224. | 0.0  |       |      |      |
| 6.05                 | 363.  | 0.0  | 11.40                                                           | 228. | 0.0  | 18.49 | 217. | 0.0  |       |      |      |

| Control pt no        | 1       | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
|----------------------|---------|--------|--------|--------|--------|--------|--------|--------|
| Dist from A (mi)     | .10     | 18.49  | 19.18  | 19.35  | 20.13  | 20.47  | 20.99  | 21.41  |
| Dist from B (mi)     | 21.32   | 2.93   | 2.24   | 2.07   | 1.29   | .95    | .43    | .01    |
| Grd elev (ft)        | 1160.00 | 216.68 | 251.94 | 251.40 | 340.00 | 340.00 | 359.88 | 400.00 |
| Above grd ht (ft)    | 35.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 50.00  |
| Bulge @ K=1.333 (ft) | 1.07    | 27.11  | 21.50  | 20.02  | 13.00  | 9.68   | 4.49   | .11    |
| 1.0 Fresnel (ft)     | 9.15    | 46.16  | 41.10  | 39.67  | 31.96  | 27.59  | 18.78  | 2.90   |
| Bulge @ K= .667 (ft) | 2.13    | 54.22  | 42.99  | 40.03  | 25.99  | 19.36  | 8.97   | .21    |
| .3 Fresnel (ft)      | 2.75    | 13.85  | 12.33  | 11.90  | 9.59   | 8.28   | 5.63   | .87    |

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Center frequency 6.175 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

|                | <u>Site 1</u> | <u>Site 2</u> | <u>Site 3</u> |
|----------------|---------------|---------------|---------------|
| Site name      | RESTON        | HOPEWELL      | INDEP         |
| Latitude       | 38-57-17.00   | 38-52-20.00   | 38-37-34.00   |
| Longitude      | 77-21-37.00   | 77-41-53.00   | 77-27-22.00   |
| Elevation (ft) | 402.00        | 1160.00       | 406.00        |

Varving antenna height of site 2

| <u>Site 1</u> |    | <u>Site 2</u> |    | <u>Site 3</u> |
|---------------|----|---------------|----|---------------|
| Height (ft)   | FN | Height (ft)   | FN | Height (ft)   |
| 50.62         | 1  | 10.00         | 1  | *****         |
| 50.62         | 1  | 15.00         | 1  | *****         |
| 50.61         | 1  | 20.00         | 1  | *****         |
| 50.61         | 1  | 25.00         | 1  | *****         |
| 50.61         | 1  | 30.00         | 1  | *****         |
| 50.61         | 1  | 35.00         | 1  | *****         |
| 50.60         | 1  | 40.00         | 1  | *****         |
| 50.60         | 1  | 45.00         | 1  | 848.09        |
| 50.60         | 1  | 50.00         | 8  | 46.65         |
| 50.60         | 1  | 55.00         | 8  | 46.65         |
| 50.59         | 1  | 60.00         | 8  | 46.65         |
| 50.59         | 1  | 65.00         | 8  | 46.65         |
| 50.59         | 1  | 70.00         | 8  | 46.64         |
| 50.59         | 1  | 75.00         | 8  | 46.64         |
| 50.58         | 1  | 80.00         | 8  | 46.64         |
| 50.58         | 1  | 85.00         | 8  | 46.64         |
| 50.58         | 1  | 90.00         | 8  | 46.64         |
| 50.58         | 1  | 95.00         | 8  | 46.63         |
| 50.57         | 1  | 100.00        | 8  | 46.63         |

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## ANTENNA HEIGHT ANALYSIS

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Center frequency 6.125 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

|                | <u>Site 1</u> | <u>Site 2</u> | <u>Site 3</u> |
|----------------|---------------|---------------|---------------|
| Site name      | RESTON        | HOPEWELL      | INDEP         |
| Latitude       | 38-57-17.00   | 38-52-20.00   | 38-37-34.00   |
| Longitude      | 77-21-37.00   | 77-41-53.00   | 77-27-22.00   |
| Elevation (ft) | 402.00        | 1160.00       | 406.00        |

Varving antenna height of site 1

| <u>Site 1</u> |    | <u>Site 2</u> |    | <u>Site 3</u> |  |
|---------------|----|---------------|----|---------------|--|
| Height (ft)   | FN | Height (ft)   | FN | Height (ft)   |  |
| 52.00         | 3  | 10.00         | 0  | *****         |  |
| 54.00         | 3  | 10.00         | 0  | *****         |  |
| 56.00         | 3  | 10.00         | 0  | *****         |  |
| 58.00         | 3  | 10.00         | 0  | *****         |  |
| 60.00         | 3  | 10.00         | 0  | *****         |  |
| 62.00         | 3  | 10.00         | 0  | *****         |  |
| 64.00         | 3  | 10.00         | 0  | *****         |  |
| 66.00         | 3  | 10.00         | 0  | *****         |  |
| 68.00         | 3  | 10.00         | 0  | *****         |  |
| 70.00         | 3  | 10.00         | 0  | *****         |  |
| 72.00         | 3  | 10.00         | 0  | *****         |  |
| 74.00         | 3  | 10.00         | 0  | *****         |  |
| 76.00         | 3  | 10.00         | 0  | *****         |  |
| 78.00         | 3  | 10.00         | 0  | *****         |  |
| 80.00         | 3  | 10.00         | 0  | *****         |  |

## SPECTRUM PLANNING, INC.

## ANTENNA HEIGHT ANALYSIS

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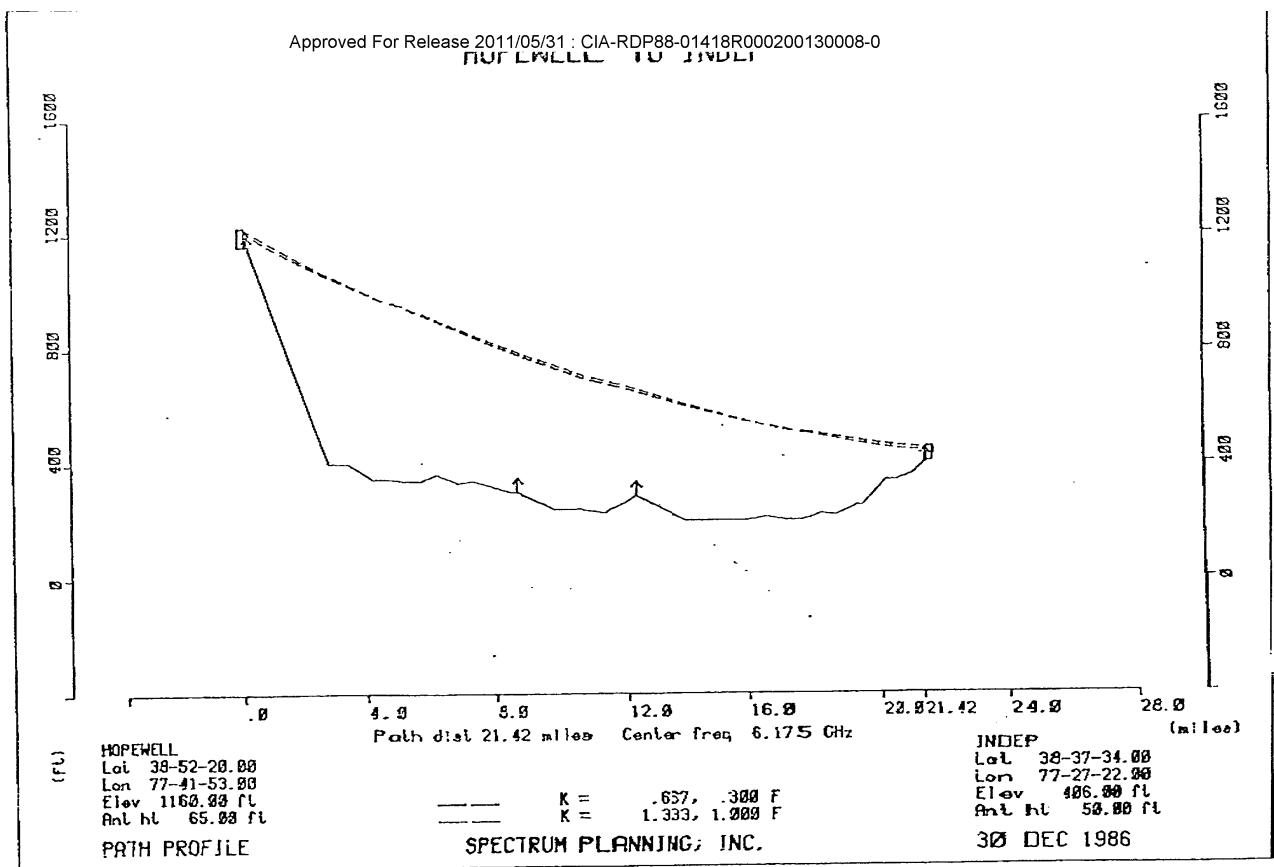
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Center frequency 6.175 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

|                | <u>Site 1</u> | <u>Site 2</u> | <u>Site 3</u> |
|----------------|---------------|---------------|---------------|
| Site name      | RESTON        | HOPEWELL      | INDEP         |
| Latitude       | 38-57-17.00   | 38-52-20.00   | 38-37-34.00   |
| Longitude      | 77-21-37.00   | 77-41-53.00   | 77-27-22.00   |
| Elevation (ft) | 402.00        | 1160.00       | 406.00        |

Varying antenna height of site 3

| <u>Site 1</u> |    | <u>Site 2</u> |    | <u>Site 3</u> |  |
|---------------|----|---------------|----|---------------|--|
| Height (ft)   | FN | Height (ft)   | FN | Height (ft)   |  |
| 50.00         | 1  | 48.73         | 1  | 50.00         |  |
| 50.60         | 1  | 48.71         | 1  | 55.00         |  |
| 50.60         | 1  | 48.69         | 1  | 60.00         |  |
| 50.60         | 1  | 48.66         | 1  | 65.00         |  |
| 50.60         | 1  | 48.64         | 1  | 70.00         |  |
| 50.60         | 1  | 48.62         | 1  | 75.00         |  |
| 50.60         | 1  | 48.59         | 1  | 80.00         |  |
| 50.60         | 1  | 48.57         | 1  | 85.00         |  |
| 50.60         | 1  | 48.55         | 1  | 90.00         |  |
| 50.60         | 1  | 48.52         | 1  | 95.00         |  |
| 50.60         | 1  | 48.50         | 1  | 100.00        |  |





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|                 |               |               |                                 |
|-----------------|---------------|---------------|---------------------------------|
|                 | <b>SITE A</b> | <b>SITE B</b> |                                 |
| Site name       | HOPEWELL GAP  | TYSONS CORNE  | Dist 25.448 miles               |
| Latitude        | 38-52-20.00   | 38-55-13.00   | Freq 6.173 GHz                  |
| Longitude       | 77-41-53.00   | 77-13-48.00   | Clearance 1) 1.00 F @ K = 1.333 |
| Elev (ft)       | 1160.00       | 520.00        | 2) .30 F @ K = .667             |
| Existed ?       | no            | no            |                                 |
| Fixed ht (ft)   |               |               |                                 |
| Max ant ht (ft) | 150.00        | 150.00        |                                 |
| Min ant ht (ft) | 10.00         | 10.00         |                                 |
| Increment (ft)  | 5.00          | 5.00          |                                 |

| Profile input points |       |      | (Ground elevations(AMSL) in ft, Obstruction heights(AOL) in ft) |      |      |       |      |      |       |      |      |
|----------------------|-------|------|-----------------------------------------------------------------|------|------|-------|------|------|-------|------|------|
| Dist                 | Gnd   | Obht | Dist                                                            | Gnd  | Obht | Dist  | Gnd  | Obht | Dist  | Gnd  | Obht |
| (mi)                 | (ft)  | (ft) | (mi)                                                            | (ft) | (ft) | (mi)  | (ft) | (ft) | (mi)  | (ft) | (ft) |
| .01                  | 1160. | 33.0 | 6.28                                                            | 300. | 0.0  | 13.87 | 300. | 0.0  | 21.20 | 350. | 0.0  |
| .35                  | 700.  | 0.0  | 6.32                                                            | 340. | 0.0  | 14.20 | 310. | 0.0  | 21.50 | 376. | 0.0  |
| .50                  | 610.  | 0.0  | 7.55                                                            | 280. | 0.0  | 14.70 | 340. | 0.0  | 22.30 | 300. | 0.0  |
| .58                  | 685.  | 0.0  | 7.90                                                            | 220. | 0.0  | 15.00 | 350. | 0.0  | 23.50 | 400. | 0.0  |
| 1.15                 | 550.  | 0.0  | 8.45                                                            | 320. | 0.0  | 15.65 | 370. | 0.0  | 24.30 | 400. | 0.0  |
| 1.90                 | 460.  | 0.0  | 8.70                                                            | 340. | 0.0  | 16.39 | 390. | 0.0  | 24.50 | 426. | 0.0  |
| 2.65                 | 440.  | 0.0  | 9.60                                                            | 280. | 0.0  | 16.90 | 400. | 0.0  | 24.87 | 480. | 50.0 |
| 3.20                 | 365.  | 0.0  | 10.20                                                           | 260. | 0.0  | 17.50 | 440. | 50.0 | 25.03 | 450. | 0.0  |
| 3.35                 | 400.  | 0.0  | 10.77                                                           | 270. | 0.0  | 18.01 | 350. | 0.0  | 25.41 | 510. | 50.0 |
| 4.32                 | 420.  | 0.0  | 12.05                                                           | 300. | 0.0  | 19.00 | 350. | 0.0  |       |      |      |
| 5.58                 | 300.  | 0.0  | 12.65                                                           | 250. | 0.0  | 19.81 | 330. | 0.0  |       |      |      |
| 5.65                 | 340.  | 0.0  | 13.30                                                           | 260. | 0.0  | 20.40 | 350. | 0.0  |       |      |      |

| Control pt no        | 1       | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
|----------------------|---------|--------|--------|--------|--------|--------|--------|--------|
| Dist from A (mi)     | .01     | 17.50  | 23.50  | 24.30  | 24.50  | 24.87  | 25.03  | 25.41  |
| Dist from B (mi)     | 25.44   | 7.95   | 1.95   | 1.15   | .95    | .58    | .42    | .04    |
| Grd elev (ft)        | 1160.00 | 440.00 | 400.00 | 400.00 | 426.00 | 480.00 | 450.00 | 510.00 |
| Above grd ht (ft)    | 35.00   | 50.00  | 0.00   | 0.00   | 0.00   | 50.00  | 0.00   | 50.00  |
| Bulge @ K=1.333 (ft) | .13     | 69.55  | 22.89  | 13.95  | 11.62  | 7.19   | 5.24   | .49    |
| 1.0 Fresnel (ft)     | 2.90    | 67.84  | 38.92  | 30.39  | 27.73  | 21.82  | 18.61  | 5.68   |
| Bulge @ K= .667 (ft) | .25     | 139.10 | 45.79  | 27.90  | 23.23  | 14.38  | 10.47  | .97    |
| .3 Fresnel (ft)      | .87     | 20.35  | 11.68  | 9.12   | 8.32   | 6.54   | 5.58   | 1.70   |

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Center frequency 6.173 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

Site 1Site 2

|                |              |              |
|----------------|--------------|--------------|
| Site name      | HOPEWELL GAP | 1YSUNS CORNE |
| Latitude       | 38-52-20.00  | 38-53-13.00  |
| Longitude      | 77-41-53.00  | 77-13-48.00  |
| Elevation (ft) | 1160.00      | 520.00       |

Varying antenna height of site 1

| Site 1         | Site 2      |
|----------------|-------------|
| Height (ft) FN | Height (ft) |

|        |   |       |
|--------|---|-------|
| 40.00  | 8 | 45.21 |
| 45.00  | 8 | 45.20 |
| 50.00  | 8 | 45.19 |
| 55.00  | 8 | 45.19 |
| 60.00  | 8 | 45.18 |
| 65.00  | 8 | 45.17 |
| 70.00  | 8 | 45.16 |
| 75.00  | 8 | 45.16 |
| 80.00  | 8 | 45.15 |
| 85.00  | 8 | 45.14 |
| 90.00  | 8 | 45.13 |
| 95.00  | 8 | 45.13 |
| 100.00 | 8 | 45.12 |
| 105.00 | 8 | 45.11 |
| 110.00 | 8 | 45.10 |
| 115.00 | 8 | 45.10 |
| 120.00 | 8 | 45.09 |
| 125.00 | 8 | 45.08 |
| 130.00 | 8 | 45.07 |
| 135.00 | 8 | 45.07 |
| 140.00 | 8 | 45.06 |
| 145.00 | 8 | 45.05 |
| 150.00 | 8 | 45.04 |

# SPECTRUM PLANNING, INC.

## ANTENNA HEIGHT ANALYSIS

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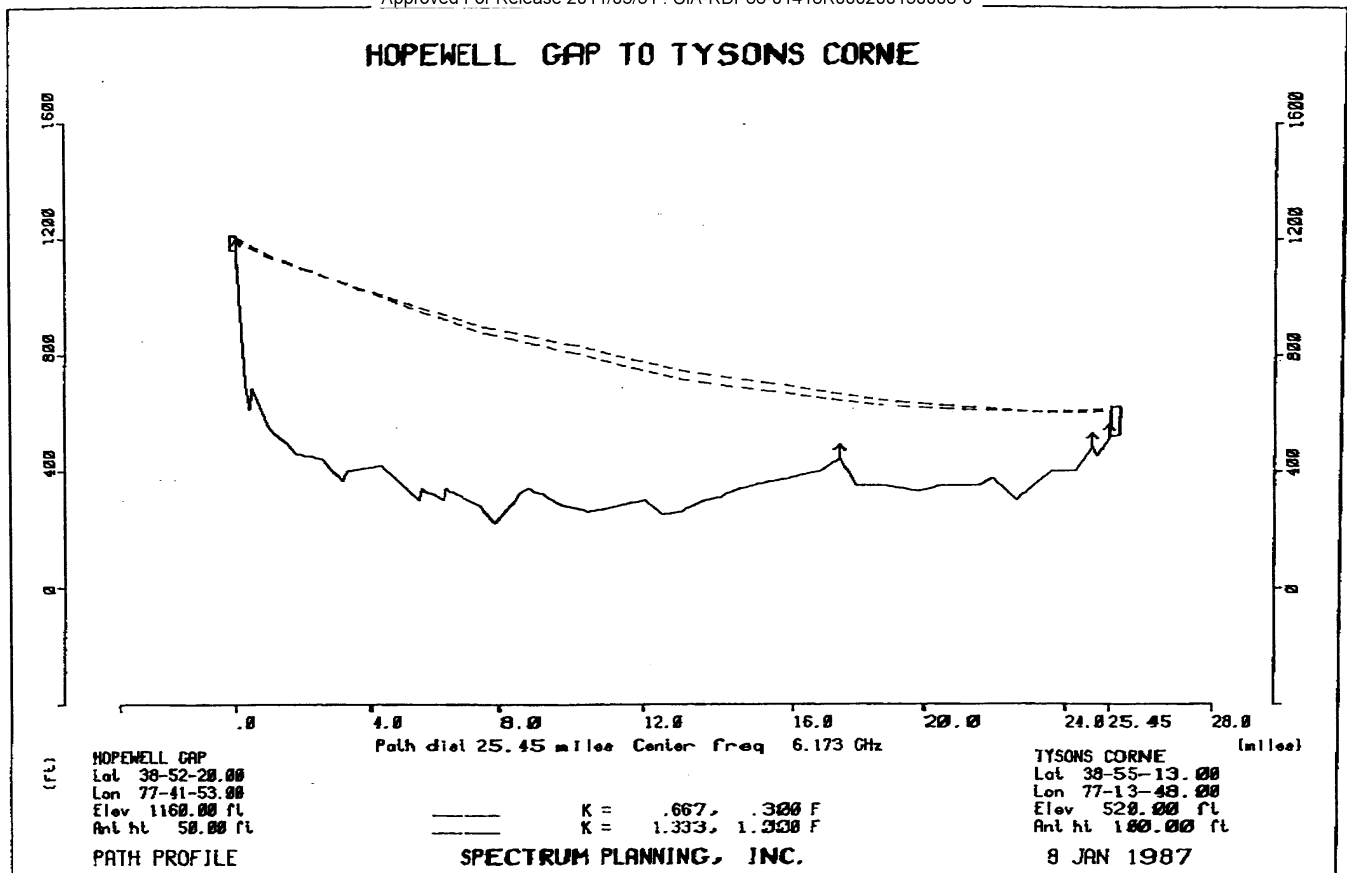
Center frequency 6.173 GHz Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

Site 1Site 2

|                |              |              |
|----------------|--------------|--------------|
| Site name      | HOPEWELL GAP | TYSONS CORNE |
| Latitude       | 38-52-20.00  | 38-55-13.00  |
| Longitude      | 77-41-53.00  | 77-13-48.00  |
| Elevation (ft) | 1160.00      | 520.00       |

Varying antenna height of site 2

| Site 1         | Site 2      |
|----------------|-------------|
| Height (ft) FN | Height (ft) |
| 178.17 8       | 45.00       |
| 38.28 1        | 50.00       |
| 38.27 1        | 55.00       |
| 38.27 1        | 60.00       |
| 38.27 1        | 65.00       |
| 38.27 1        | 70.00       |
| 38.27 1        | 75.00       |
| 38.26 1        | 80.00       |
| 38.26 1        | 85.00       |
| 38.26 1        | 90.00       |
| 38.26 1        | 95.00       |
| 38.26 1        | 100.00      |
| 38.25 1        | 105.00      |
| 38.25 1        | 110.00      |
| 38.25 1        | 115.00      |
| 38.25 1        | 120.00      |
| 38.25 1        | 125.00      |
| 38.24 1        | 130.00      |
| 38.24 1        | 135.00      |
| 38.24 1        | 140.00      |
| 38.24 1        | 145.00      |
| 38.24 1        | 150.00      |



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|                 | <u>SITE A</u> | <u>SITE B</u> |                                 |
|-----------------|---------------|---------------|---------------------------------|
| Site name       | HOPEWELL GAP  | TYSONS CORNE  | Dist 25.448 miles               |
| Latitude        | 38-52-20.00   | 38-55-13.00   | Freq 6.173 GHz                  |
| Longitude       | 77-41-53.00   | 77-13-48.00   | Clearance 1) 1.00 F @ K = 1.333 |
| Elev (ft)       | 1160.00       | 520.00        | 2) .30 F @ K = .667             |
| Existed ?       | no            | no            |                                 |
| Fixed ht (ft)   |               |               |                                 |
| Max ant ht (ft) | 150.00        | 150.00        |                                 |
| Min ant ht (ft) | 10.00         | 10.00         |                                 |
| Increment (ft)  | 5.00          | 5.00          |                                 |

| Profile input points |       |      | (Ground elevations(AMSL) in ft, Obstruction heights(AOL) in ft) |      |      |       |      |      |       |      |      |
|----------------------|-------|------|-----------------------------------------------------------------|------|------|-------|------|------|-------|------|------|
| Dist                 | Gnd   | Obht | Dist                                                            | Gnd  | Obht | Dist  | Gnd  | Obht | Dist  | Gnd  | Obht |
| (mi)                 | (ft)  | (ft) | (mi)                                                            | (ft) | (ft) | (mi)  | (ft) | (ft) | (mi)  | (ft) | (ft) |
| .01                  | 1160. | 35.0 | 6.28                                                            | 300. | 0.0  | 13.87 | 300. | 0.0  | 21.20 | 350. | 0.0  |
| .35                  | 700.  | 0.0  | 6.32                                                            | 340. | 0.0  | 14.20 | 310. | 0.0  | 21.50 | 376. | 0.0  |
| .50                  | 610.  | 0.0  | 7.55                                                            | 280. | 0.0  | 14.70 | 340. | 0.0  | 22.30 | 300. | 0.0  |
| .58                  | 685.  | 0.0  | 7.90                                                            | 220. | 0.0  | 15.00 | 350. | 0.0  | 23.50 | 400. | 0.0  |
| 1.15                 | 550.  | 0.0  | 8.45                                                            | 320. | 0.0  | 15.65 | 370. | 0.0  | 24.30 | 400. | 0.0  |
| 1.90                 | 460.  | 0.0  | 8.70                                                            | 340. | 0.0  | 16.39 | 390. | 0.0  | 24.50 | 426. | 0.0  |
| 2.65                 | 440.  | 0.0  | 9.60                                                            | 280. | 0.0  | 16.90 | 400. | 0.0  | 24.87 | 480. | 50.0 |
| 3.20                 | 365.  | 0.0  | 10.20                                                           | 260. | 0.0  | 17.50 | 440. | 50.0 | 25.03 | 450. | 0.0  |
| 3.35                 | 400.  | 0.0  | 10.77                                                           | 270. | 0.0  | 18.01 | 350. | 0.0  | 25.41 | 510. | 50.0 |
| 4.32                 | 420.  | 0.0  | 12.05                                                           | 300. | 0.0  | 19.00 | 350. | 0.0  |       |      |      |
| 5.58                 | 300.  | 0.0  | 12.65                                                           | 250. | 0.0  | 19.81 | 330. | 0.0  |       |      |      |
| 5.65                 | 340.  | 0.0  | 13.30                                                           | 260. | 0.0  | 20.40 | 350. | 0.0  |       |      |      |

| Control pt no        | 1       | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
|----------------------|---------|--------|--------|--------|--------|--------|--------|--------|
| Dist from A (mi)     | .01     | 17.50  | 23.50  | 24.30  | 24.50  | 24.87  | 25.03  | 25.41  |
| Dist from B (mi)     | 25.44   | 7.95   | 1.95   | 1.15   | .95    | .58    | .42    | .04    |
| Grd elev (ft)        | 1160.00 | 440.00 | 400.00 | 400.00 | 426.00 | 480.00 | 450.00 | 510.00 |
| Above grd ht (ft)    | 35.00   | 50.00  | 0.00   | 0.00   | 0.00   | 50.00  | 0.00   | 50.00  |
| Bulge @ K=1.333 (ft) | .13     | 69.55  | 22.89  | 13.95  | 11.62  | 7.19   | 5.24   | .49    |
| 1.0 Fresnel (ft)     | 2.90    | 67.84  | 38.92  | 30.39  | 27.73  | 21.82  | 18.61  | 5.68   |
| Bulge @ K= .667 (ft) | .25     | 139.10 | 45.79  | 27.90  | 23.23  | 14.38  | 10.47  | .97    |
| .3 Fresnel (ft)      | .87     | 20.35  | 11.68  | 9.12   | 8.32   | 6.54   | 5.58   | 1.70   |

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PAGE 2

Center frequency 6.173 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

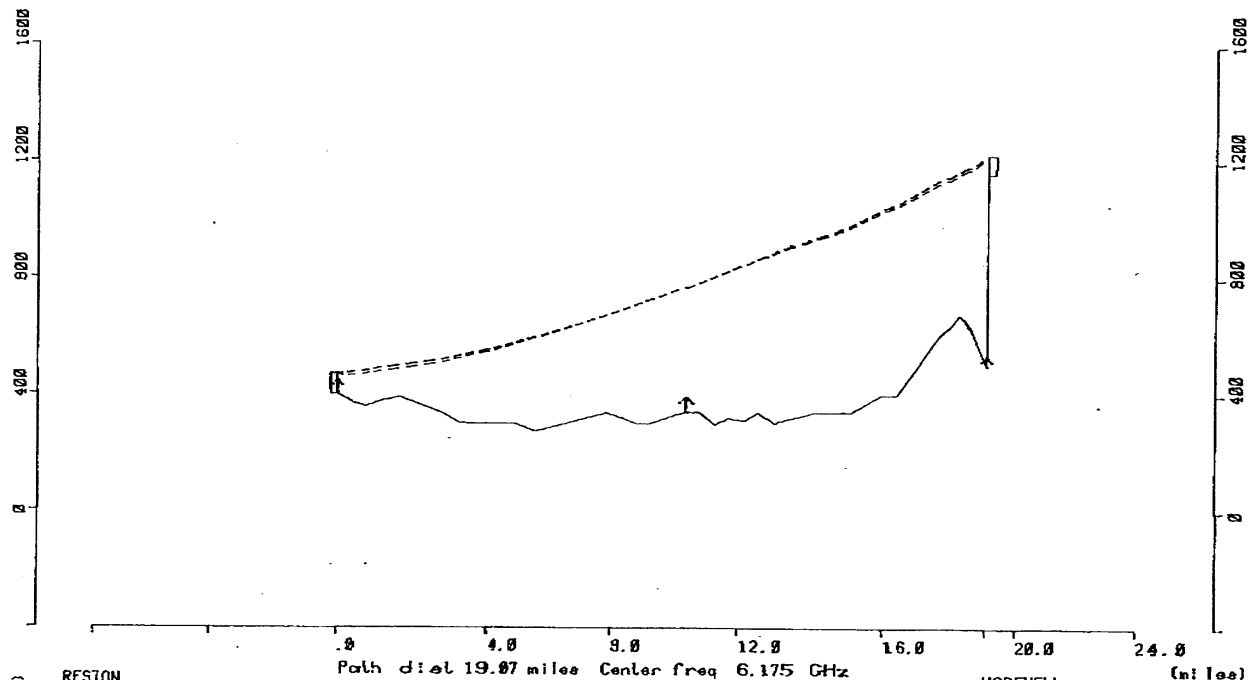
Site 1Site 2

|                |              |              |
|----------------|--------------|--------------|
| Site name      | HOPEWELL GAP | 1YSUNS CORNE |
| Latitude       | 38-52-20.00  | 38-55-13.00  |
| Longitude      | 77-41-53.00  | 77-13-48.00  |
| Elevation (ft) | 1160.00      | 520.00       |

Varying antenna height of site 1

| Site 1<br>Height (ft) | FN | Site 2<br>Height (ft) |
|-----------------------|----|-----------------------|
| 40.00                 | 8  | 45.21                 |
| 45.00                 | 8  | 45.20                 |
| 50.00                 | 8  | 45.19                 |
| 55.00                 | 8  | 45.19                 |
| 60.00                 | 8  | 45.18                 |
| 65.00                 | 8  | 45.17                 |
| 70.00                 | 8  | 45.16                 |
| 75.00                 | 8  | 45.16                 |
| 80.00                 | 8  | 45.15                 |
| 85.00                 | 8  | 45.14                 |
| 90.00                 | 8  | 45.13                 |
| 95.00                 | 8  | 45.13                 |
| 100.00                | 8  | 45.12                 |
| 105.00                | 8  | 45.11                 |
| 110.00                | 8  | 45.10                 |
| 115.00                | 8  | 45.10                 |
| 120.00                | 8  | 45.09                 |
| 125.00                | 8  | 45.08                 |
| 130.00                | 8  | 45.07                 |
| 135.00                | 8  | 45.07                 |
| 140.00                | 8  | 45.06                 |
| 145.00                | 8  | 45.05                 |
| 150.00                | 8  | 45.04                 |

# RESTON TO HOPEWELL



RESTON  
Lat 38-57-17.00  
Lon 77-21-37.00  
Elev 402.00 ft  
Ant ht 71.00 ft

HOPEWELL  
Lat 38-52-20.00  
Lon 77-41-53.00  
Elev 1160.00 ft  
Ant ht 65.00 ft

PATH PROFILE

SPECTRUM PLANNING, INC.

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## ANTENNA HEIGHT ANALYSIS

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|                 |               |               |                                 |
|-----------------|---------------|---------------|---------------------------------|
|                 | <u>SITE A</u> | <u>SITE B</u> | Dist 19.070 miles               |
| Site name       | RESTON        | HOPEWELL      | Freq 6.175 GHz                  |
| Latitude        | 38-57-17.00   | 38-52-20.00   | Clearance 1) 1.00 F @ K = 1.333 |
| Longitude       | 77-21-37.00   | 77-41-53.00   | 2) .30 F @ K = .667             |
| Elev (ft)       | 402.00        | 1160.00       |                                 |
| Existed ?       | no            | no            |                                 |
| Fixed ht (ft)   |               |               |                                 |
| Max ant ht (ft) | 80.00         | 100.00        |                                 |
| Min ant ht (ft) | 50.00         | 10.00         |                                 |
| Increment (ft)  | 2.00          | 5.00          |                                 |

| Profile input points |      |      | (Ground elevations(AGSL) in ft, Obstruction heights(AGL) in ft) |      |      |       |      |      |       |      |      |
|----------------------|------|------|-----------------------------------------------------------------|------|------|-------|------|------|-------|------|------|
| Dist                 | Grd  | Obht | Dist                                                            | Grd  | Obht | Dist  | Grd  | Obht | Dist  | Grd  | Obht |
| (mi)                 | (ft) | (ft) | (mi)                                                            | (ft) | (ft) | (mi)  | (ft) | (ft) | (mi)  | (ft) | (ft) |
| .01                  | 400. | 50.0 | 7.86                                                            | 339. | 0.0  | 12.59 | 339. | 0.0  | 15.94 | 400. | 0.0  |
| .84                  | 357. | 0.0  | 8.85                                                            | 300. | 0.0  | 13.05 | 301. | 0.0  | 16.39 | 400. | 0.0  |
| 1.75                 | 392. | 0.0  | 9.23                                                            | 300. | 0.0  | 14.04 | 340. | 0.0  | 18.23 | 675. | 0.0  |
| 3.20                 | 302. | 0.0  | 10.30                                                           | 340. | 50.0 | 14.42 | 340. | 0.0  | 18.39 | 665. | 0.0  |
| 3.36                 | 302. | 0.0  | 10.68                                                           | 340. | 0.0  | 14.50 | 340. | 0.0  | 19.06 | 500. | 35.0 |
| 3.66                 | 300. | 0.0  | 11.21                                                           | 297. | 0.0  | 14.57 | 340. | 0.0  |       |      |      |
| 4.88                 | 300. | 0.0  | 11.67                                                           | 320. | 0.0  | 14.72 | 341. | 0.0  |       |      |      |
| 5.57                 | 274. | 0.0  | 12.13                                                           | 311. | 0.0  | 14.95 | 340. | 0.0  |       |      |      |

| Control pt no        | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Dist from A (mi)     | .01    | .84    | 1.75   | 3.20   | 3.36   | 3.66   | 4.88   | 5.57   |
| Dist from B (mi)     | 19.06  | 18.23  | 17.32  | 15.87  | 15.71  | 15.41  | 14.19  | 13.50  |
| Grd elev (ft)        | 400.00 | 357.48 | 392.18 | 301.86 | 302.22 | 300.00 | 300.00 | 274.48 |
| Above grd ht (ft)    | 50.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   |
| Bulge @ K=1.333 (ft) | .10    | 7.65   | 15.19  | 25.42  | 26.37  | 28.21  | 34.64  | 37.60  |
| 1.0 Fresnel (ft)     | 2.90   | 25.99  | 36.62  | 47.37  | 48.25  | 49.91  | 55.30  | 57.61  |
| Bulge @ K=.667 (ft)  | .19    | 15.30  | 30.38  | 50.84  | 52.75  | 56.42  | 69.27  | 75.19  |
| .3 Fresnel (ft)      | .87    | 7.80   | 10.99  | 14.21  | 14.48  | 14.97  | 16.59  | 17.28  |



## SPECTRUM PLANNING, INC.

## ANTENNA HEIGHT ANALYSIS

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|                 |               |               |                                 |
|-----------------|---------------|---------------|---------------------------------|
|                 | <u>SITE A</u> | <u>SITE B</u> | Dist 21.420 miles               |
| Site name       | HOPEWELL      | INDEP         | Freq 6.175 GHz                  |
| Latitude        | 38-52-20.00   | 38-37-34.00   | Clearance 1) 1.00 F @ K = 1.333 |
| Longitude       | 77-41-53.00   | 77-27-22.00   | 2) .30 F @ K = .667             |
| Elev (ft)       | 1160.00       | 406.00        |                                 |
| Existed ?       | no            | no            |                                 |
| Fixed ht (ft)   |               |               |                                 |
| Max ant ht (ft) | 100.00        | 100.00        |                                 |
| Min ant ht (ft) | 10.00         | 10.00         |                                 |
| Increment (ft)  | 5.00          | 5.00          |                                 |

| Profile input points |       |      | (Ground elevations(AMSL) in ft, Obstruction heights(AGL) in ft) |      |      |       |      |      |       |      |      |
|----------------------|-------|------|-----------------------------------------------------------------|------|------|-------|------|------|-------|------|------|
| Dist                 | Grd   | Obht | Dist                                                            | Grd  | Obht | Dist  | Grd  | Obht | Dist  | Grd  | Obht |
| (mi)                 | (ft)  | (ft) | (mi)                                                            | (ft) | (ft) | (mi)  | (ft) | (ft) | (mi)  | (ft) | (ft) |
| .10                  | 1160. | 35.0 | 6.74                                                            | 332. | 0.0  | 12.27 | 287. | 50.0 | 19.18 | 252. | 0.0  |
| 2.85                 | 400.  | 0.0  | 7.26                                                            | 340. | 0.0  | 13.91 | 280. | 0.0  | 19.35 | 251. | 0.0  |
| 3.46                 | 400.  | 0.0  | 8.55                                                            | 299. | 0.0  | 15.98 | 200. | 0.0  | 20.13 | 340. | 0.0  |
| 4.23                 | 345.  | 0.0  | 8.73                                                            | 300. | 50.0 | 16.59 | 211. | 0.0  | 20.47 | 340. | 0.0  |
| 4.58                 | 347.  | 0.0  | 9.93                                                            | 240. | 0.0  | 17.19 | 208. | 0.0  | 20.99 | 380. | 0.0  |
| 5.01                 | 340.  | 0.0  | 10.63                                                           | 240. | 0.0  | 17.54 | 200. | 0.0  | 21.41 | 400. | 50.0 |
| 5.53                 | 340.  | 0.0  | 10.80                                                           | 242. | 0.0  | 18.06 | 224. | 0.0  |       |      |      |
| 6.05                 | 363.  | 0.0  | 11.40                                                           | 228. | 0.0  | 18.49 | 217. | 0.0  |       |      |      |

| Control pt no        | 1       | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
|----------------------|---------|--------|--------|--------|--------|--------|--------|--------|
| Dist from A (mi)     | .10     | 18.49  | 19.18  | 19.35  | 20.13  | 20.47  | 20.99  | 21.41  |
| Dist from B (mi)     | 21.32   | 2.93   | 2.24   | 2.87   | 1.29   | .95    | .43    | .01    |
| Grd elev (ft)        | 1160.00 | 216.68 | 251.94 | 251.40 | 340.00 | 340.00 | 359.88 | 400.00 |
| Above grd ht (ft)    | 35.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 50.00  |
| Bulge @ K=1.333 (ft) | 1.07    | 27.11  | 21.50  | 20.02  | 13.00  | 9.68   | 4.49   | .11    |
| 1.0 Fresnel (ft)     | 9.15    | 46.16  | 41.10  | 39.67  | 31.96  | 27.59  | 18.78  | 2.90   |
| Bulge @ K= .667 (ft) | 2.13    | 54.22  | 42.99  | 40.03  | 25.99  | 19.36  | 8.97   | .21    |
| .3 Fresnel (ft)      | 2.75    | 13.85  | 12.33  | 11.90  | 9.59   | 8.28   | 5.63   | .87    |

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Center frequency 6.175 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

|                | <u>Site 1</u> | <u>Site 2</u> | <u>Site 3</u> |
|----------------|---------------|---------------|---------------|
| Site name      | RESTON        | HOPEWELL      | INDEP         |
| Latitude       | 38-57-17.00   | 38-52-20.00   | 38-37-34.00   |
| Longitude      | 77-21-37.00   | 77-41-53.00   | 77-27-22.00   |
| Elevation (ft) | 402.00        | 1160.00       | 406.00        |

Varying antenna height of site 2

| <u>Site 1</u> |    | <u>Site 2</u> |    | <u>Site 3</u> |
|---------------|----|---------------|----|---------------|
| Height (ft)   | FN | Height (ft)   | FN | Height (ft)   |
| 50.62         | 1  | 10.00         | 1  | *****         |
| 50.62         | 1  | 15.00         | 1  | *****         |
| 50.61         | 1  | 20.00         | 1  | *****         |
| 50.61         | 1  | 25.00         | 1  | *****         |
| 50.61         | 1  | 30.00         | 1  | *****         |
| 50.61         | 1  | 35.00         | 1  | *****         |
| 50.60         | 1  | 40.00         | 1  | *****         |
| 50.60         | 1  | 45.00         | 1  | 848.09        |
| 50.60         | 1  | 50.00         | 8  | 46.65         |
| 50.60         | 1  | 55.00         | 8  | 46.65         |
| 50.59         | 1  | 60.00         | 8  | 46.65         |
| 50.59         | 1  | 65.00         | 8  | 46.65         |
| 50.59         | 1  | 70.00         | 8  | 46.64         |
| 50.59         | 1  | 75.00         | 8  | 46.64         |
| 50.58         | 1  | 80.00         | 8  | 46.64         |
| 50.58         | 1  | 85.00         | 8  | 46.64         |
| 50.58         | 1  | 90.00         | 8  | 46.64         |
| 50.58         | 1  | 95.00         | 8  | 46.63         |
| 50.57         | 1  | 100.00        | 8  | 46.63         |

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 ANTENNA HEIGHT ANALYSIS  
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Center frequency 6.175 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

|                | <u>Site 1</u> | <u>Site 2</u> | <u>Site 3</u> |
|----------------|---------------|---------------|---------------|
| Site name      | RESTON        | HOPEWELL      | INDEP         |
| Latitude       | 38-57-17.00   | 38-52-20.00   | 38-37-34.00   |
| Longitude      | 77-21-37.00   | 77-41-53.00   | 77-27-22.00   |
| Elevation (ft) | 402.00        | 1160.00       | 406.00        |

Varying antenna height of site 1

| <u>Site 1</u> |    | <u>Site 2</u> |    | <u>Site 3</u> |
|---------------|----|---------------|----|---------------|
| Height (ft)   | FN | Height (ft)   | FN | Height (ft)   |
| 52.00         | 3  | 10.00         | 0  | *****         |
| 54.00         | 3  | 10.00         | 0  | *****         |
| 56.00         | 3  | 10.00         | 0  | *****         |
| 58.00         | 3  | 10.00         | 0  | *****         |
| 60.00         | 3  | 10.00         | 0  | *****         |
| 62.00         | 3  | 10.00         | 0  | *****         |
| 64.00         | 3  | 10.00         | 0  | *****         |
| 66.00         | 3  | 10.00         | 0  | *****         |
| 68.00         | 3  | 10.00         | 0  | *****         |
| 70.00         | 3  | 10.00         | 0  | *****         |
| 72.00         | 3  | 10.00         | 0  | *****         |
| 74.00         | 3  | 10.00         | 0  | *****         |
| 76.00         | 3  | 10.00         | 0  | *****         |
| 78.00         | 3  | 10.00         | 0  | *****         |
| 80.00         | 3  | 10.00         | 0  | *****         |

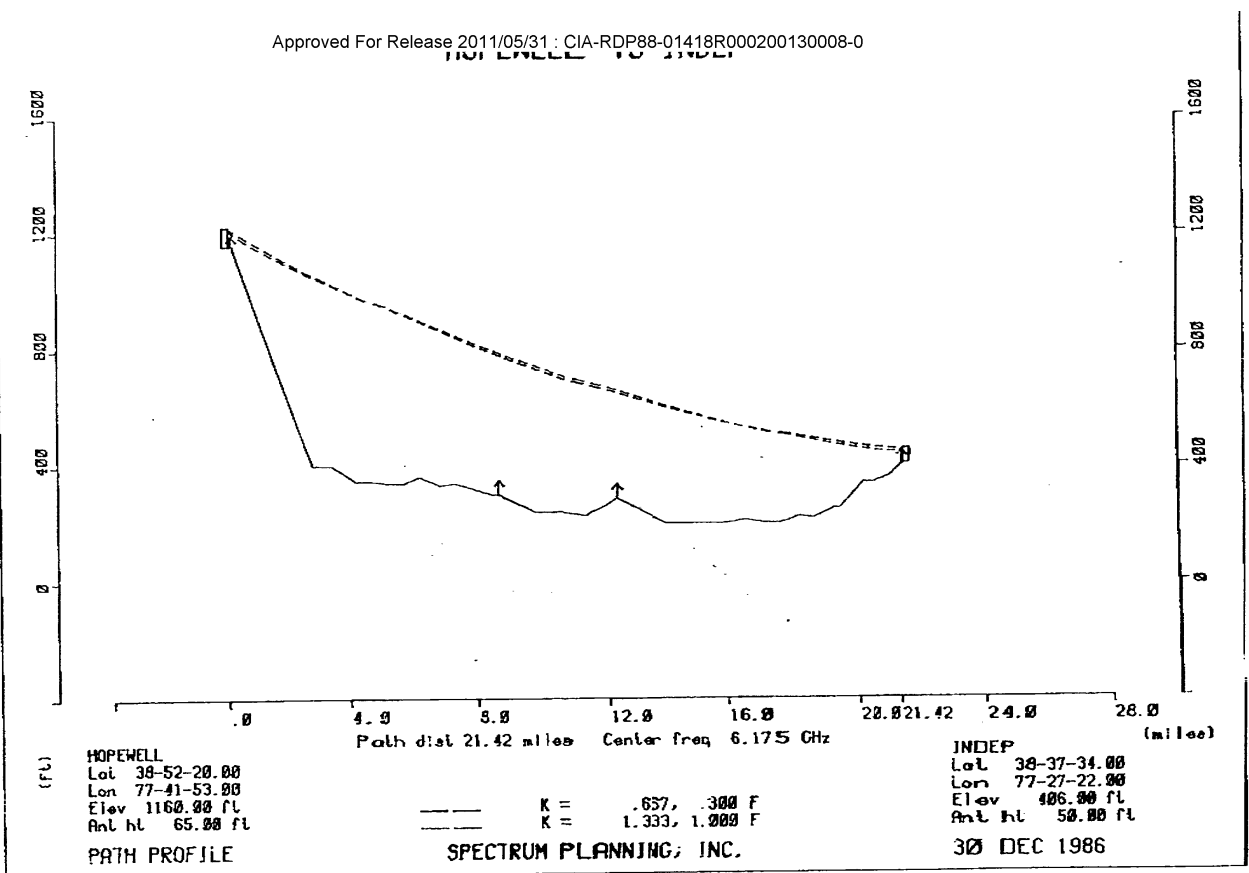
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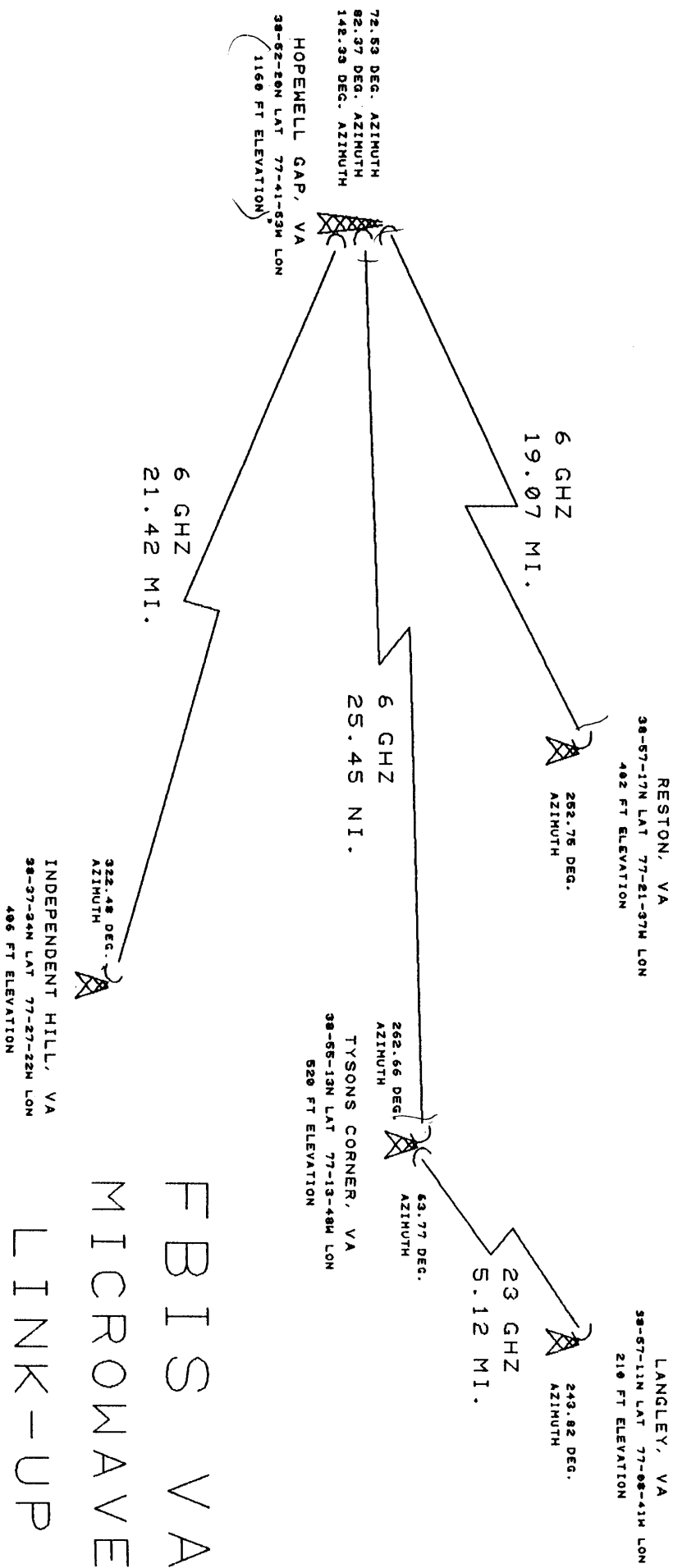
Center frequency 8.175 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

|                | <u>Site 1</u> | <u>Site 2</u> | <u>Site 3</u> |
|----------------|---------------|---------------|---------------|
| Site name      | RESTON        | HOPEWELL      | INDEP         |
| Latitude       | 38-57-17.00   | 38-52-20.00   | 38-37-34.00   |
| Longitude      | 77-21-37.00   | 77-41-53.00   | 77-27-22.00   |
| Elevation (ft) | 402.00        | 1160.00       | 406.00        |

Varying antenna height of site 3

| <u>Site 1</u> |    | <u>Site 2</u> |    | <u>Site 3</u> |
|---------------|----|---------------|----|---------------|
| Height (ft)   | FN | Height (ft)   | FN | Height (ft)   |
| 50.00         | 1  | 48.73         | 1  | 50.00         |
| 50.60         | 1  | 48.71         | 1  | 55.00         |
| 50.60         | 1  | 48.69         | 1  | 60.00         |
| 50.60         | 1  | 48.66         | 1  | 65.00         |
| 50.60         | 1  | 48.64         | 1  | 70.00         |
| 50.60         | 1  | 48.62         | 1  | 75.00         |
| 50.60         | 1  | 48.59         | 1  | 80.00         |
| 50.60         | 1  | 48.57         | 1  | 85.00         |
| 50.60         | 1  | 48.55         | 1  | 90.00         |
| 50.60         | 1  | 48.52         | 1  | 95.00         |
| 50.60         | 1  | 48.50         | 1  | 100.00        |





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|                 | <u>SITE A</u> | <u>SITE B</u> |                                 |
|-----------------|---------------|---------------|---------------------------------|
| Site name       | HOPEWELL GAP  | TYSONS CORNE  | Dist 23.448 miles               |
| Latitude        | 38-52-20.00   | 38-55-13.00   | Freq 6.173 GHz                  |
| Longitude       | 77-41-53.00   | 77-13-48.00   | Clearance 1) 1.00 F @ K = 1.333 |
| Elev (ft)       | 1160.00       | 520.00        | 2) .30 F @ K = .667             |
| Existed ?       | no            | no            |                                 |
| Fixed ht (ft)   |               |               |                                 |
| Max ant ht (ft) | 150.00        | 150.00        |                                 |
| Min ant ht (ft) | 10.00         | 10.00         |                                 |
| Increment (ft)  | 5.00          | 5.00          |                                 |

| Profile input points |       |      | (Ground elevations(AMSL) in ft, Obstruction heights(AOL) in ft) |      |      |       |      |      |       |      |      |
|----------------------|-------|------|-----------------------------------------------------------------|------|------|-------|------|------|-------|------|------|
| Dist                 | Gnd   | Obht | Dist                                                            | Gnd  | Obht | Dist  | Gnd  | Obht | Dist  | Gnd  | Obht |
| (mi)                 | (ft)  | (ft) | (mi)                                                            | (ft) | (ft) | (mi)  | (ft) | (ft) | (mi)  | (ft) | (ft) |
| .01                  | 1160. | 33.0 | 6.28                                                            | 300. | 0.0  | 13.87 | 300. | 0.0  | 21.20 | 350. | 0.0  |
| .33                  | 700.  | 0.0  | 6.32                                                            | 340. | 0.0  | 14.20 | 310. | 0.0  | 21.50 | 376. | 0.0  |
| .50                  | 610.  | 0.0  | 7.33                                                            | 280. | 0.0  | 14.70 | 340. | 0.0  | 22.30 | 300. | 0.0  |
| .58                  | 685.  | 0.0  | 7.90                                                            | 220. | 0.0  | 15.00 | 350. | 0.0  | 23.50 | 400. | 0.0  |
| 1.15                 | 550.  | 0.0  | 8.45                                                            | 320. | 0.0  | 15.65 | 370. | 0.0  | 24.30 | 400. | 0.0  |
| 1.90                 | 460.  | 0.0  | 8.70                                                            | 340. | 0.0  | 16.39 | 390. | 0.0  | 24.50 | 426. | 0.0  |
| 2.65                 | 440.  | 0.0  | 9.60                                                            | 280. | 0.0  | 16.90 | 400. | 0.0  | 24.87 | 480. | 50.0 |
| 3.20                 | 365.  | 0.0  | 10.20                                                           | 260. | 0.0  | 17.50 | 440. | 50.0 | 25.03 | 450. | 0.0  |
| 3.35                 | 400.  | 0.0  | 10.77                                                           | 270. | 0.0  | 18.01 | 350. | 0.0  | 25.41 | 510. | 50.0 |
| 4.32                 | 420.  | 0.0  | 12.05                                                           | 300. | 0.0  | 19.00 | 350. | 0.0  |       |      |      |
| 5.58                 | 300.  | 0.0  | 12.65                                                           | 250. | 0.0  | 19.81 | 330. | 0.0  |       |      |      |
| 5.65                 | 340.  | 0.0  | 13.30                                                           | 260. | 0.0  | 20.40 | 350. | 0.0  |       |      |      |

| Control pt no        | 1       | 2      | 3      | 4      | 5      | 6      | 7      | 8      |
|----------------------|---------|--------|--------|--------|--------|--------|--------|--------|
| Dist from A (mi)     | .01     | 17.50  | 23.50  | 24.30  | 24.50  | 24.87  | 25.03  | 25.41  |
| Dist from B (mi)     | 25.44   | 7.95   | 1.95   | 1.15   | .95    | .58    | .42    | .04    |
| Grd elev (ft)        | 1160.00 | 440.00 | 400.00 | 400.00 | 426.00 | 480.00 | 450.00 | 510.00 |
| Above grd ht (ft)    | 35.00   | 50.00  | 0.00   | 0.00   | 0.00   | 50.00  | 0.00   | 50.00  |
| Bulge @ K=1.333 (ft) | .13     | 69.53  | 22.89  | 13.95  | 11.62  | 7.19   | 5.24   | .49    |
| 1.0 Fresnel (ft)     | 2.90    | 67.84  | 38.92  | 30.39  | 27.73  | 21.82  | 18.61  | 5.68   |
| Bulge @ K=.667 (ft)  | .25     | 139.10 | 45.79  | 27.90  | 23.23  | 14.38  | 10.47  | .97    |
| .3 Fresnel (ft)      | .87     | 20.35  | 11.68  | 9.12   | 8.32   | 6.54   | 5.58   | 1.70   |

**SPECTRUM PLANNING, INC.**

ANTENNA HEIGHT ANALYSIS

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Center frequency 6.173 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

Site 1Site 2

|                |              |              |
|----------------|--------------|--------------|
| Site name      | HOPEWELL GAP | LYSUNS CORNE |
| Latitude       | 38-52-20.00  | 38-53-13.00  |
| Longitude      | 77-41-53.00  | 77-13-48.00  |
| Elevation (ft) | 1160.00      | 520.00       |

Varying antenna height of site 1

| Site 1         | Site 2      |
|----------------|-------------|
| Height (ft) FN | Height (ft) |
| 40.00 8        | 45.21       |
| 45.00 8        | 45.20       |
| 50.00 8        | 45.19       |
| 55.00 8        | 45.19       |
| 60.00 8        | 45.18       |
| 65.00 8        | 45.17       |
| 70.00 8        | 45.16       |
| 75.00 8        | 45.16       |
| 80.00 8        | 45.15       |
| 85.00 8        | 45.14       |
| 90.00 8        | 45.13       |
| 95.00 8        | 45.13       |
| 100.00 8       | 45.12       |
| 105.00 8       | 45.11       |
| 110.00 8       | 45.10       |
| 115.00 8       | 45.10       |
| 120.00 8       | 45.09       |
| 125.00 8       | 45.08       |
| 130.00 8       | 45.07       |
| 135.00 8       | 45.07       |
| 140.00 8       | 45.06       |
| 145.00 8       | 45.05       |
| 150.00 8       | 45.04       |



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PAGE 3

Center frequency 6.173 GHz; Clearance criteria 1) 1.000 F at K = 1.333  
 2) .300 F at K = .667

Site 1Site 2

|                |              |              |
|----------------|--------------|--------------|
| Site name      | HOPEWELL GAP | TYSONS CORNE |
| Latitude       | 38-52-20.00  | 38-55-13.00  |
| Longitude      | 77-41-53.00  | 77-13-48.00  |
| Elevation (ft) | 1160.00      | 520.00       |

Varying antenna height of site 2

| Site 1         | Site 2      |
|----------------|-------------|
| Height (ft) FN | Height (ft) |
| 178.17 8       | 45.00       |
| 38.28 1        | 50.00       |
| 38.27 1        | 55.00       |
| 38.27 1        | 60.00       |
| 38.27 1        | 65.00       |
| 38.27 1        | 70.00       |
| 38.27 1        | 75.00       |
| 38.26 1        | 80.00       |
| 38.26 1        | 85.00       |
| 38.26 1        | 90.00       |
| 38.26 1        | 95.00       |
| 38.26 1        | 100.00      |
| 38.25 1        | 105.00      |
| 38.25 1        | 110.00      |
| 38.25 1        | 115.00      |
| 38.25 1        | 120.00      |
| 38.25 1        | 125.00      |
| 38.24 1        | 130.00      |
| 38.24 1        | 135.00      |
| 38.24 1        | 140.00      |
| 38.24 1        | 145.00      |
| 38.24 1        | 150.00      |

